



METCALFE
ARCHITECTURE & DESIGN

“GREEN” HIGHLIGHTS

**An Architect’s Perspective:
Behind the Scenes and Below the Surface
of
Out on a Limb- a Tree Adventure exhibit at the Morris Arboretum**

Echoing the theme of the Morris Arboretum’s Tree Adventure exhibit, *we need trees, and trees need us*, Metcalfe Architecture & Design’s team incorporated the highest standard of tree and site protection throughout the entire design and construction of the *Out on a Limb* tree canopy walk. The Tree Adventure exhibit is designed to nurture a sense of stewardship toward trees in our urban (and suburban) communities. Many of these environments are under stress due to the changes humans have wrought upon the natural world. Trees in these settings depend on people to help maintain conditions that provide necessary food, water and sunlight. Attention to this inter-dependence dictated all of the construction decisions for *Out on a Limb* (OOAL).

KEY GREEN FEATURES of *Out on a Limb* (OOAL)

Structure

OOAL’s structure does not touch the trees as direct contact could harm them. The structure is comprised of recyclable metal and wood. It is a “lightweight structure” of steel and six inch diameter “micro pile” foundations. These foundations are delicately located among the trees, whereas typical concrete foundations of 24” in diameter could damage, or even kill the trees.

The project is sustainable in that the structure is lightweight. This lightweight structure can be relocated, as the woods are an ever-changing environment. It was important to create a semi-permanent structure that could be rebuilt without starting over should something happen to one of the trees. If a tree dies in the Squirrel Scramble area that is surrounded by netting, the exhibit could be relocated by digging a new micro-pile foundation in a different location.

Sustainability

Out on a Limb – is intended to *tiptoe* through the trees’ root systems using small foundations called “micro-piles”. According to Alan Metcalfe, “We are building this 450-foot walkway exhibit right through the middle of a museum collection of trees. Our exhibit focuses on their tree specimens. If we dug the foundations too close to the trees’ roots, we could kill the basis of our exhibit.” Therefore, one important sustainability issue was to determine locations to avoid the root systems of each tree in or near the exhibit.

Tree Protection

The use of micro piles made it easier to avoid the roots. This issue became especially important at the Chestnut Oak, a 250-year-old tree that is the centerpiece of the exhibit and is surrounded by structure and decking. Arborists assisted the team by blowing away the soil that surrounded the root systems (using a type of giant leaf blower) so the engineers could carefully place foundations in areas that would not disturb the ancient tree’s extensive root systems. To protect

its roots, layers of mulch with stabilizing fabric were installed to insulate it from traffic on the soil above the root systems.

To safeguard the tree trunks, a protective casing of wood slats was placed around the trees in the construction site from the ground level to six feet upward. This technique is also replicated 30 feet up to shield the upper trees from damage by the construction cranes.

To lessen the impact of OOAL on the environment and Morris Arboretum's natural wooded site, pre-fabrication of the structure and interpretive components were constructed off-site to minimize site (and tree disturbance). OOAL's pieces arrived by truck and have been boomed in by a 160-ton crane where site workers can bolt it to the foundations.

OOAL is also structurally sustainable in that all of pieces of the exhibit are structurally independent. If a tree falls onto OOAL and destroys part of the deck, the rest of the project will remain safely in tact.

Sustainable Materials

The Boardwalk of *Out on a Limb* consists of sustainably harvested black locust wood decking, locally cut (within 500 miles per LEED requirements). This wood is naturally bug and rot resistant, and has been used over the centuries for fence posts. It has gained in popularity of late because it is locally available and does not need chemical treatment like pressure-treated lumber (that could be harmful to children sitting on it). This issue has been a contentious subject for the past five years with municipal governments (Atlantic City and Ocean City) arguing about the use of rot resistant pressure-treated or rainforest wood products for boardwalks. New York City now uses black locust in all their park benches which do not require chemical treatment..

LED lighting offers lower energy consumption, smaller size, longer life and greater brightness than conventional incandescent lighting.